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Integrating E-learning into the transdisciplinary methodology as a solution to the challenges of 21st century society

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Abstract

This paper is based on the idea that the 21st century society is confronted with two major challenges: the changing of the cultural paradigm and the amazing evolution of the informational technologies of communication. According to this special context the public education – as an institution – cannot ignore these profound challenges; it has to face them properly and to look for proper solutions to assimilate them.

Hence, the paper deals with a theoretical debate upon the consequences a possible integration of these informational technologies into the transdisciplinary methodology – specific to the new paradigm – could emerge. An important conceptual distinction is made among the meanings of *learning/ knowledge/ understanding* in order to underline the benefits and the losses, the limits and the perspectives the integration of e-learning into the transdisciplinary methodology could generate in the field of education.

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1. Introduction

The assumption of this paper is based on is the idea that the present day society is confronted with two major challenges: an important changing of the cultural paradigm and a radical evolution of information and communication technologies.

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According to our view a cultural paradigm is based on three pillars which are (co-)interrelated: the vision on the world, the vision on the knowledge, the vision on the human being (society, culture, education, etc.). The 21st century cultural paradigm – as Basarab Nicolescu has already affirmed – is the paradigm of cosmodernity, based on transdisciplinarity. Basarab Nicolescu defined the term “cosmodernity” as being different from *postmodernity* and also from *transmodernity* (Muresan, 2010).

Thus, when the cultural paradigm changes, a change also needs to be done in the field of education. Any autonomous approach on education (independently of the three pillars of the paradigm) is irrelevant, random, noxious and without any real efficiency. As a consequence *an educational paradigm has to be imperatively conceived in correlation to the cultural paradigm in the context of which it is built up.*

Another major challenge for the present society is the outstanding evolution of informational technologies, the development of the internet. The „digital era” represents one of the most important revolutionary changes of our times. It offers a lot of educational openings or affordances which cannot be ignored by the sciences of education. New opportunities for the teaching-learning process have been achieved. One of the most well known is the e-learning. *Considering the differences between face to face learning and e-learning, appropriate instructional designs should be developed for the later one.*

Taking into account all these presumptions the main idea of this paper is to analyze how the transdisciplinary methodology (the core of cosmodernity) and the *e-learning* could be combined in the benefit of education, how the new technologies can transform education according to transdisciplinarity approach.

Could the integration of the *e-learning* into the *transdisciplinary methodology* be a proper solution for the education in the 21st century society? Could it be possible? What does it really mean and imply? What are the compatibilities and the incompatibilities between them? What consequences could emerge from such an attempt?

2. Traditional education vs. Transdisciplinary education

In order to understand correctly all these matters some conceptual clarifications are mostly required. First of all we have to explain what *transdisciplinarity* really means and what are the differences between the traditional education and the transdisciplinary one.

Transdisciplinarity is a term and a concept that is largely used today, in many fields and all over the world. The word “transdisciplinarity” is used in various meanings which bring about conceptual deviations and semantic slipping that give rise to dangerous confusions. The present day scientific community has not yet a terminological and conceptual consensus on “transdisciplinarity”. The most frequent and inconsistent uses of this term and concept entails errors in understanding and application. On one hand, the confusion is made between *pluridisciplinarity* - *interdisciplinarity* and *transdisciplinarity*; on the other hand, on the relation among them as well.

Therefore, we do consider that a minimal updating of the concept of transdisciplinarity is absolutely necessary, taking into account the given definition in Basarab Nicolescu and CIRET group view. According to this view, *transdisciplinarity is a methodology*. The three axioms the transdisciplinarity is based on are (Nicolescu, 1985, 2002a, 2005, 2006a, 2006b, 2008):

- a. ontology - Levels of Reality and the Hidden Third,
- b. the Logic of the Included Middle,
- c. epistemology – knowledge as an emergent complexity.

Transdisciplinarity cannot be understood and applied in the absence of full consideration given to the above mentioned axioms. To ignore or to eliminate one of them triggers about the risk of a falsification of the transdisciplinarity concept, the risk of erroneous slipping, and applications of the latter, in all areas.

We have to point out that transdisciplinarity *is not another discipline*. According to Nicolescu’s consecrated definition, “Transdisciplinarity concerns what is at the same time *between* disciplines, *inside* various disciplines and *beyond* any discipline. Its aim is the understanding of the current world and one of its imperatives is the unity of knowledge” (Nicolescu, 2002b, p. 232).

Also it is imperiously needed to understand that transdisciplinarity is not a method but a *methodology*. Method and methodology are sometimes used as synonyms – but they aren’t. *Methodology* is the study of methods and deals with the philosophical assumptions underlying the research process, while a *method* is a specific technique for data

collection under those philosophical assumptions. A methodology is a system of methods and principles for doing something, for example for teaching or for carrying out research.

Consequently, we can firmly state transdisciplinarity to be the conclusive factor in the changing of the knowledge paradigm for the 21st century. New methodological keys are hence offered by the recuperation of the Subject place in knowledge, by the logic of the included middle, by a new understanding of Reality – according to the ontology of Reality levels and the Hidden Middle – and by the realization of the incompleteness of knowledge. These outcomes open a large opportunity for many applications in various fields: education is a privileged one. In our opinion, transdisciplinarity can offer a sustainable solution to the educational crisis mankind is facing nowadays.

As a conclusion, transdisciplinary education can be properly understood only within the frame of the transdisciplinary methodology. The following synthetic scheme will easily point out the deep changes brought out by transdisciplinary educational approach as opposed to the present day one in the public system (Table 1).

Table 1. The four pillars of education from traditional and transdisciplinary perspective

	Traditional education	Transdisciplinary education
Learning to know	Knowing	Understanding
Learning to do	Doing/ acting	Creating
Learning to live together	In society	In society and in the universe
Learning to be	Existing	Being

This issue is largely explained in Mirela Muresan's article (Muresan, 2013).

Now we feel that we are entitled to sum up the following conclusions:

- **Learning** is a complex *process* which implies equally the mind, the soul and the body; the inner and outer experience,
- Learning generates an important *product*: **knowledge** (information, competences, values),
- Learning and knowledge is not enough: they have to be integrated in a superior **understanding** of their meaning,
- The goals of the traditional education stop at the knowledge level, which is enough for a proper social insertion of the individual. The transdisciplinary education – as an integral one – seeks for more than that: **understanding of the meaning of knowledge**.

Transdisciplinary education allows every individual to understand both the meaning of his own existence and the meaning of existence in general. It is the only way to “cure” the specific symptoms of the complex crisis mankind is facing today: “the loss of meaning and the universal hunger for meaning” (Nicolescu, 1999).

At this point we can already anticipate that e-learning is only a part in the holistic approach of an integral transdisciplinary education. The following schema reveals the position the e-learning has in this perspective:

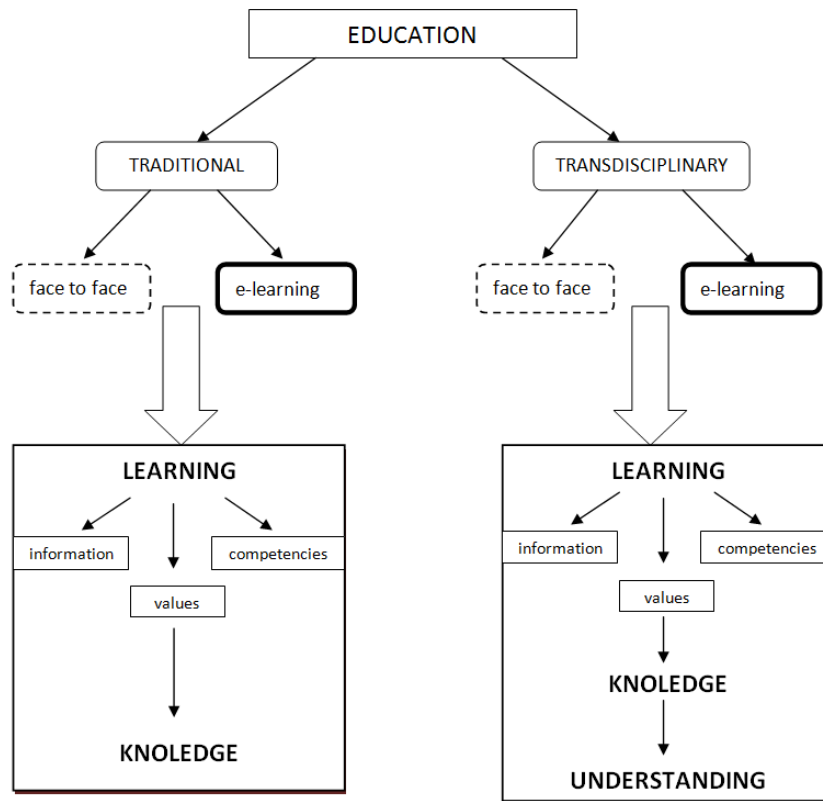


Figure 1. E-learning integration in traditional and transdisciplinary education

3. E-learning vs. face to face learning

Education could not remain indifferent to the development of Internet and communication technologies. The cybernetic revolution led to a different form of education: the e-learning. Even though there are many definitions of e-learning advanced by various authors, its essence can be captured as "training delivered on a digital device such as a smart phone or a laptop computer that is designed to support individual learning or organizational performance" (Clark and Mayer, 2011, p. 7).

The implementation of e-learning in educational systems is faced with several challenges due to the fact that only few differences between *e-learning* and *face to face* learning are considered. The particularities of e-learning emphasize the necessity to develop specific instructional designs. The transition from face to face teaching to e-learning goes beyond communication channel differentiation.

Based on e-learning affordances discussed by Cope and Kalantzis (2013a, 2013b), we present the main particularities of e-learning and compare them with their face to face learning counterparts (Table 2).

Table 2. A comparison between *face to face* learning and *e-learning*

face to face learning	e-learning
Specific space and time	Ubiquitous learning – anywhere, anytime
Receiving meanings (passive)	Designing meanings (active)
Traditional codes and channels (text and image)	Multimodal meaning – different codes and channels (text, image, sound, data)
One feedback – normative assessment	Recursive feedback – formative assessment
Individual intelligence – knowledge consumers	Collaborative intelligence – knowledge producers
Cognition	Metacognition – thinking about thinking
Homogenizing teaching	Differentiated learning
Focused on teaching – teacher centered	Focused on learning – student centered

Ubiquitous learning. While face to face learning requires a specific time and space (usually the classroom), the participants to an e-learning course can be anywhere and anytime. This offers time and space flexibility extremely important for individual timing and the globalized world.

Designing meanings. In traditional face to face education the source of knowledge was represented by an authority – the teacher, a book author or an expert. Knowledge was a given. In today's knowledge society learners have access to multiple sources, some of which could have different perspective on the same subject. Therefore, the learner must actively search the information, analyze it and attach a specific meaning to it: "Knowledge is something that must be actively made, discovered through process of navigation, sifted through processes of critical discernment, and reformulated as one's own" (Cope & Kalantzis, 2013b, p. 3).

Multimodal meaning. Until recently, the main way of capturing and transmitting information in face to face education was textual. E-learning allows multiple means of formulating and transmitting knowledge, from text to image, sound and video, which facilitates learners to supplement the classic textual information.

Formative assessment. In classical face to face learning, the assessment takes place in certain moments of educational process and has mainly a normative purpose. E-learning, on the other hand, is based on media environments allowing recursive feedback. Assessment takes a formative role, rather a normative one, in e-learning.

Collaborative intelligence. Face to face education is focused on transmitting information from an authorised source. The learner is mainly a knowledge consumer of someone else's ideas. In current knowledge society and cyberspace accessible information, one does not need to memorize and reproduce a specific content. Information being always accessible, the learner can recreate it at any time using different available sources.

Metacognition. Empowering the learner, e-learning emphasizes self-reflection in order to determine the learner to think about the nature of the tasks and to assess the degree the learning goals are achieved. Thus, e-learning goes beyond face to face learning which focus on cognition.

Differentiated learning. Face to face education is mainly interested in finding the best teaching, while e-learning in mainly focused on best learning. Obviously, traditional education entails homogenized teaching and e-learning is concerned with differentiated learning as a function of learner's needs, individual rhythm and potentialities.

Summing at this point, we can conclude that the main difference between face to face learning and e-learning consist in their focus upon teaching and learning process. All the other differences emerge from this focus.

Even there are important differences between face to face learning and e-learning, both still belong to the same traditional educational framework. In order to valorise all affordances of e-learning, one more step is necessary: the integration of e-learning in the transdisciplinary methodology.

4. Consequences of integrating e-learning into the transdisciplinary methodology

Approaching e-learning from a transdisciplinary perspective could improve the learning experience by promoting an authentic learning (Mustea et al., 2011). Integrating e-learning into the transdisciplinary methodology might be an answer to the challenges that education faces in the 21st century. The consequences of this integration have both strengths and weaknesses, which will be discussed below.

We believe that the balance tilts enough in favour of advantages to strongly support the integration of e-learning into the transdisciplinary methodology. First of all, in order to help the learner to adapt and become integrated into the world he lives, the purpose of learning should go beyond knowledge, to understanding. By empowering the student, e-learning promotes an active role of the student in learning, facilitating the way to understanding to a higher degree as compared to the traditional education. Thus, the role of the Subject in learning is really recuperated.

The recovery of the Subject and the authentic learning are also facilitated by the use of multiple codes and learning channels in e-learning. By addressing multiple senses and being focused on learner, multiple levels of perception are actualized, which helps the learner to integrate the information and leading to authentic learning by combining external knowledge and interior experience.

E-learning also promotes active knowledge production, which leads to a dialog with the others in a globalized transcultural and transreligious cyber space, as well as a inner dialog with himself through metacognition.

The recursive and collaborative formative assessment promoted by e-learning allows the evaluation of the human being as a whole, not only from a singular point of view concerning social insertion. E-learning technologies allow the assessment of the process of learning, of the individual potential and, also a global evaluation. This kind of assessment folds rather on a transdisciplinary perspective than on traditional normative education.

Another advantage refers to the reduced long-term costs of e-learning, widely discussed in the literature, and worth mention here too.

As in any pioneering work, the obstacles are not missing. Understanding, interpreting and applying e-learning through the lens of traditional education limits considerably the benefits and potentialities of e-learning. Even from a transdisciplinary perspective, there are still some limits which e-learning needs to overcome.

One of these challenges refers to the lack of empathy between the teacher and the learner because of the virtual contact. The role of the teacher as a mentor is reduced, but not totally eliminated. This is due to the institutionalization of the educational system, not necessarily due to the e-learning environment. In spite of the fact that modern technologies allow audio-video interaction, they cannot capture the essence of a mentoring relationship. The mentor should be perceived as a whole in the plenitude of his being: with all his thoughts, beliefs, behaviours, passions, feelings etc.

As mentioned above, the final goal of transdisciplinary education is understanding, not merely the accumulation of knowledge. Attaining the understanding implies a great deal of strivings from the learner. Anyway, nobody can guarantee that one will achieve understanding or when it will happen.

Apparently, there is a striking difference between the logic of computers and the one used by transdisciplinarity. We emphasize the word „apparently”. It is true that the second axiom of transdisciplinarity refers to the logic of included middle, while most computers use a binary logic (the logic of excluded third). But the computer and the information and communication technologies are just instruments used to reach a certain goal. The main role in learning belongs to the Subject not to the instruments he uses. It is the mind of the Subject which must make the shift to the cosmodernity. The development of new technologies might lead to the construction of computers based on the logic of the included middle. If we continue to think in a binary way and considering only a horizontal perspective of a single level of reality, e-learning might not benefit from the advantages of a transdisciplinary perspective.

5. Conclusions

Considering the above discussed challenges for the education of the 21st century society, we could formulate the following statements:

- It is imperiously necessary to change the educational paradigm according to the new cultural paradigm of cosmodernity (transdisciplinarity) the 21st century society is facing on;
- It is necessary to properly integrate the new information and communication technologies into the public education and to adapt them to a transdisciplinary approach;
- It is necessary to recover e-learning and integrate it in the transdisciplinary education in order to benefit from all the affordances and opportunities it is able to generate;
- A proper valorization of these benefits is needed;
- Awareness of all the limits and losses this integration could emerge is necessary.

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